Claim Listing:

This listing of claims replaces all prior versions of claims in the application.

1-11 (Canceled).

12. (Previously Presented) A method for real-time determination of exhaust gas flow through an exhaust pipe of a vehicle, the method comprising:

measuring a pressure difference upstream and downstream of a screen;

measuring exhaust gas temperature; and

determining the exhaust gas flow based on the pressure difference and the temperature, wherein the screen covers substantially the entire area of the exhaust pipe.

13. (Canceled).

14. (Previously Presented) A method for real-time determination of exhaust gas flow through an exhaust pipe of a vehicle, the method comprising:

measuring a pressure difference upstream and downstream of a screen;

measuring exhaust gas temperature; and

determining the exhaust gas flow based on the pressure difference and the temperature,

wherein the screen includes about six strands per inch arranged in a generally rectangular array that extends across the exhaust pipe.

15-20 (Canceled).

21. (Previously Presented) A portable system for determining exhaust gas flow of a vehicle, the system comprising:

a tube adapted for placement on an exhaust pipe of the vehicle, the tube including a flow restricting element extending substantially entirely across a cross-sectional area of the tube, a first port disposed upstream of the flow restricting element for measuring a first pressure, and a second port disposed downstream of the flow restricting element for measuring a second pressure; and

a device in communication with the tube for determining the exhaust gas flow based on a difference between the first and second pressures,

wherein the flow restricting element comprises a screen and the screen comprises a plurality of strands arranged in a generally square array with less than ten strands per inch.

22-35 (Canceled).

36. (New) The method of claim 12 wherein determining the exhaust gas flow comprises determining the exhaust gas flow based on a square root of the quotient of the pressure difference and the temperature.

37. (New) The method of claim 12 wherein determining the exhaust gas flow further comprises:

determining a constant based on known flows, known temperatures, and a measured pressure difference; and

multiplying the constant by a square root of the quotient of the pressure difference and the temperature.

38. (New) The method of claim 12 wherein determining the exhaust gas flow comprises determining the exhaust gas flow according to:

Flow = K * (pressure difference)^{x} * (temperature)^{y} where "K" represents a constant.

39. (New) The method of claim 38 further comprising:

measuring the pressure difference for a plurality of known flows and a constant temperature; and

determining slope of the logarithm of the known flows as a function of the logarithm of the pressure differences to determine a value for the exponent "x".

40. (New) The method of claim 38 further comprising:

measuring the pressure difference for a plurality of known temperatures and a constant flow;

determining slope of the logarithm of the quotient of the flow and the pressure difference as a function of the logarithm of the temperature for each temperature; and

averaging the slopes for each temperature to determine a value for the exponent "y".

41. (New) The method of claim 12 wherein determining the exhaust gas flow comprises determining the exhaust gas flow according to: differential pressure = A * flow + B*flow^2 , where "A" and "B" are empirically determined constants.

42. (New) The method of claim 41 wherein "A" and "B" are determined during calibration by measuring differential pressures across the screen during a low flow condition and a high flow condition, respectively, at a reference exhaust gas temperature and ambient pressure.

43. (New) The method of claim 12 wherein determining the exhaust gas flow further comprises adjusting the real-time measured pressure difference based on measured exhaust gas temperature, a reference exhaust gas temperature, measured ambient pressure, and a reference ambient pressure.

44. (New) The method of claim 43 wherein the real-time measured pressure difference is adjusted by multiplying by a factor "K", where: $K=(TREF/Tactual)^{-2Y}(PAmbient/PREF)$ and "Y" is determined based on a relationship of differential pressure as a function of temperature for the low flow and high flow conditions.

45. (New) The method of claim 12 wherein the screen has a mesh selected to generate a measurable pressure difference while minimizing back pressure and formation of condensation on the screen.

46. (New) The system of claim 21 wherein the tube further comprises a third port for measuring temperature of exhaust gas flowing through the tube.

47. (New) The system of claim 46 further comprising a thermocouple extending through the third port and in communication with the device to measure temperature of the exhaust gas flowing through the tube.

48. (New) The system of claim 21 wherein the device determines the exhaust gas flow based on a difference between the first and second pressures and the temperature of the exhaust gas.

49. (New) The system of claim 21 wherein the device includes at least one differential pressure transducer to generate a signal based on the difference between the first and second pressures.

50. (New) The system of claim 21 wherein the screen is made of stainless steel.

51. (New) The system of claim 21 wherein the screen comprises regularly spaced openings.

52. (New) The system of claim 21 wherein the screen openings comprise between 60% and 65% of the cross-sectional area of the exhaust pipe.

53. (New) The system of claim 21 wherein the screen includes sufficient spaces to limit any increase in back pressure to less than six percent.